

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Invertebrate Abstract

Element Code: **IICOL63010**

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Psephenus arizonensis*
COMMON NAME: Arizona Water Penny Beetle
SYNONYMS:
FAMILY: Psephenidae

AUTHOR, PLACE OF PUBLICATION:

TYPE LOCALITY: Known only from specimens collected in Cave Creek near the Southwest Research Station, Portal, Arizona.

TYPE SPECIMEN: Murvosh. C.M. 11 May 1972. Collected as mature larvae. 19 of these larvae reared to adults by H.P. Brown.

TAXONOMIC UNIQUENESS: Taxonomic status of *P. arizonensis* and closely related *P. montanus* is uncertain. Individuals from these two populations were originally assigned as separate species based on differences in ecology and ethology. Believed, however, that these will be synonymized as subspecies of the same species. See Additional Information for discussion of findings by Murvosh and Brown (2000).

DESCRIPTION: Oval, flattened, brownish to black. Forewing broadest posteriorly, loosely covering abdomen. Dorsal surface sparsely pubescent, ventral surface densely pubescent. Abdomen with 5-7 ventral segments, 4.0-6.0 mm (0.16-0.24 in.). (Borror and White 1970).

AIDS TO IDENTIFICATION:

ILLUSTRATIONS: Drawing (Borror and White 1970:173)
B&W drawing (Brock and Prechal 2001)

TOTAL RANGE: Chiricahua Mountains, Cochise County, Arizona.

RANGE WITHIN ARIZONA: See "Total Range."

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Water penny beetles distributed throughout the width of streams. However, in this species, all life stages except larvae may be restricted to distinct microhabitats, typically in riffles within one meter of shoreline. Peak emergence of adults occurs from about mid June to early July. Adults of both sexes are short-lived; females only live several days while males live 1 to 2 weeks. Consequently adults are only present from mid to late June until mid-July.

REPRODUCTION: Adult females occur on partly submerged rocks near the shoreline while males probably occur on the same rocks but often in moist or slightly wet depressions or pits, tending to be very inactive. Mating ensues soon after emergence, probably beneath the same rocks from which the individuals emerged. Mating probably lasts less than a minute and may or may not include "play" behavior that occurs in other species of *Psephenus*. After mating, females probably crawl beneath partly submerged stones near shoreline in riffle habitats where they spend the rest of their life, a few days, laying eggs. First instar larvae develop in about two weeks. The larval stage includes several instars, lasting one to two years. During this stage, larvae probably

disperse to all parts of the stream and then move back close to shoreline shortly before pupation. Pupation occurs beneath rocks or in other protected sites near the stream. Adults usually emerge from the pupal stage in 10-12 days.

FOOD HABITS: These beetles are largely herbivores/detritivores but adults probably do little if any feeding. Larvae typically graze on diatoms and other algae that occur on rocks and pebbles in stream riffles.

HABITAT: Cold, fast-flowing high elevation streams in the Chiricahua Mountains. This restricted distribution may be caused by poor dispersal ability which appears to occur only during larval stages.

ELEVATION: 5,800 ft. (1769 m). A record in the Heritage Data Management System (HDMS), reports the elevation at 5,300 ft. (1617 m) (AGFD, unpublished data accessed 2001).

PLANT COMMUNITY: Oak Woodland

POPULATION TRENDS:

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[C2 USDI, FWS 1994]
[C2 USDI, FWS 1991]
[C2 USDI, FWS 1989]

STATE STATUS: None
OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1999)
[Forest Service Sensitive USDA, FS Region 3 1988]

MANAGEMENT FACTORS: Threats to this species are those that affect aquatic areas such as grazing, logging, mining, development of recreational facilities and their subsequent impacts. Threats are primarily restricted to egg, larval, and pupal stages as adults are short-lived. Based on AGFD (1996 in prep), “**Management needs:** fencing to protect springs from effects of livestock; periodic monitoring of populations and habitats. **Threats:** restricted geographic distribution with associated potential for extinction due to chance events; water developments, including pond construction; habitat degradation due to livestock grazing.”

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Surveys should be undertaken to obtain more information regarding distribution, abundance and potential threats.

LAND MANAGEMENT/OWNERSHIP: Private.

SOURCES OF FURTHER INFORMATION

LITERATURE CITATIONS:

- Arizona Game and Fish Department (AGFD). 1996 in prep. Wildlife of Special Concern in Arizona. AGFD, Phoenix, AZ. p. 6.
- Borror, D. J. and R. W. White. 1970. Insects: Peterson Field Guides. pp. 172-173.
- Brown, H. P. and C. M. Murvosh. 2000. A revision of the genus *Psephenus* (water penny beetles) of the United States and Canada. Trans. Amer. Ent. Soc. Vol. 100.
- Brock, J. and S. Prchal. 2001. Sensitive Insect Species of the Coronado National Project. A Training Project by Sonoran Arthropod Studies Institute.
- Johnson, R. 1992. Unpublished status survey report for United States Fish and Wildlife Service.
- USDA, Forest Service Region 3. 1988. Regional Forester's Sensitive Species List.

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

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- H.P. Brown, Department of Zoology, University of Oklahoma, Norman, OK 73019.

See Robert Johnson's survey report for a listing of experts in the taxon as well as a listing of pertinent literature.

ADDITIONAL INFORMATION:

The following is an abstract of a paper presented May 31, 2000 at the North American Benthological Society Annual Meeting.

Proposed Synonymy in the Water Penny Beetle Genus *Psephenus*

C.M. Murvosh and H.P Brown

There are seven described species of *Psephenus* in the United States, four of which are from Arizona. *P. minckleyi* and *P. murvoshi* are known from several Arizona localities, but *P. murvoshi* also seems widespread in Mexico. Later, *P. arizonensis* was described from the Chiricahua Mountains and *P. montanus* from the White Mountains of Arizona. *P. oresbius* previously was described from a unique male from the mountains of Durango, Mexico. Further examination of additional material of *P. arizonensis* and *P. montanus* and from the type of locality of *P. oresbius* lead us to conclude that the differences between *P. arizonensis* and *P. montanus* are due to environmentally induced variability. They are members of the same species and they also are the same as *P. oresbius*. We propose to lump them with *P. oresbius*. There is a high probability that *P. murvoshi* mentioned above is synonymous with *P. usingeri* which Hinton previously described from a single specimen from Mexico. We presently are working to resolve this.

Revised: 1992-07-17 (DBI)
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